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Olesen, Anne Vingaard; Oddershede, Lars; Ehlers, Lars Holger; Hvidberg, Michael Falk; Petersen, Karin Dam

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Generating a set of preference-based EQ-5D index scores for chronic conditions using a percentage-scale

Authors: Anne Vingaard Olesen, Lars Oddershede, Michael Falk Hvidberg, Lars Ehlers, Karin Dam Petersen

The Danish Centre for Healthcare Improvements, Aalborg University, Denmark

Key words

EQ-5D index scores; marginal disutilities; chronic conditions; percentage-scale

Background

Sullivan and colleagues contributed significantly to health economic practice through their catalogues of community-based preference scores. But their methods may have drawbacks which we wish to elaborate on. Sullivan and colleagues use median regression thus reporting median differences. However, if the disutilities are to be used to value health states in a health economic evaluation, a median difference might not be preferable as most health economic models are based on mean values. In addition, we consider estimation of disutilities as relative mean differences.

Objectives

We aim to estimate mean marginal disutilities - and as something new: mean disutilities *in percent* relative to a disease-free reference population.

Methodology

We utilized a health survey answered by 19,537 adults in The Northern Region of Denmark which included self-reported information on 16 chronic disorders. The health survey comprised the EQ-5D which was valued using the Danish Time Trade-Off preference weights. We estimated adjusted marginal disutilities as weighted averages or medians in OLS or median regression respectively but bootstrapped standard errors allowing for larger variation. Censored Least Absolute Deviations (CLAD) median regression was also conducted. The percentage-scale disutilities were estimated through a logarithmic transformation of the EQ-5D scores. A standard biostatistical approach makes interpretation of estimates as relative differences possible when estimates are numerically below

0.25. All estimates of disutility were adjusted for sex and age. No adjustment for number of chronic conditions was performed.

Results

We report estimates of the new percentage-scale marginal disutilities; for comparison both mean-based and median-based conventional disutilities. The latter were similar to CLAD regression estimates. Some examples;

Arthritis was associated with a mean disutility of 0.07 (SE=0.003) and a median disutility of 0.12 (SE=0.005) which constituted the largest discrepancy between mean- and median-based estimates. The estimated percentage-scale loss was 10% (SE=0.6%) compared with an arthritis-free reference population.

The most serious health state on the relative scale was cerebral thrombosis which had an estimated 24% (SE=3.8%) reduction in utility. The mean and median reduction on conventional scale was 0.11 (SE=0.011) and 0.12 (SE=0.012) respectively. As an example, consider a simple Markov Model of patients at risk of experiencing a cerebral thrombosis with health states: 1) Well, 2) Cerebral thrombosis and 3) Death. If the mean EQ-5D score is 0.90 for patients in the health state “well”; experiencing a cerebral thrombosis would yield an EQ-5D score of $(1-0.24)*0.90=0.68$ using the percentage-scale and $0.90-0.12=0.78$ using the median scale. If the baseline EQ-5D was lower in the health state “well”, e.g. 0.65, this would yield an EQ-5D score of $(1-0.24)*0.65=0.49$ after cerebral thrombosis; for comparison, $0.65-0.12=0.53$ using the median scale.

Conclusions

We suggested a percentage-scale estimation of EQ-5D index scores for chronic disorders as an alternative to existing median-based methods. Our mini-catalogue stems from a simpler model, which we argue, is easier to use and interpret than median differences. For 11 out of 16 chronic conditions the mean- and median-based disutilities were similar (difference below 0.01).

Presenter: Anne Vingaard Olesen; avo@business.aau.dk

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